PROTECTIVE IRRIGATION WORKS,

RAJPUTANA.

COMPLIMENTARY

REPORT

ON THE

TAKRO PROJECT

IN THE

·BUNDI STATE.

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INDEX.

PLANS.

BUNDI STATE.

REPORT ON THE TAKRO PROJECT.

1. This is the fourth of the small projects for which surveys were made in the Bundi State. There is an old Dam below the village of Takro which has been lying breached for many years, and though there are some wells below, the water level in them is very low, and if a tank is constructed as proposed, not only would these wells be benefited and the area irrigated from them increased, but other land at present lying idle for want of water, would be brought under cultivation. *Project described.*

2. If the old Dam was repaired 12 wells and the land irrigated from them would be submerged, and it would be better to construct a new Dam above the village where there is a good site, and where only 5 wells would be submerged. *Site described.*

A small collection of huts belonging to cultivators would have to be removed to higher ground, but this would have to be done in either case, and their land can be cultivated as the water recedes. The Dam would be 1,343 r. ft. in length, starting on the west from the ridge on which lower down the village of Takro is built, across to the parallel ridge on the other side of the nullah.

The Weir would be at the west end at right angles to the Dam in a small gap in the Takro Ridge.

3. The catchment area is only $2\frac{1}{8}$ square miles, as flood water of the Jhajour nullah which rises in the hills 3 miles to the north of that village (see Index Plan No. 1) never passes the natural ridge of low hills between Jhajour and Takro, but spreads over the Jhajour land, which is cultivated as the water dries up. *Catchment area.*

4 With this $2\frac{1}{8}$ square miles of hilly catchment, we may allow 13 per cent. of the average rainfall of $21\frac{1}{2}$ inches as available for storage, or 16 m. c. ft. *Water available for storage.*

5. The weir level is, however, limited to R. L. 116 (R. L. 100 being taken as bed level of nullah at site), as the top of the two ridges at the propsed site, between which the Dam will be constructed, is R. L. 120. *Weir level.*

The level of the top of Dam will therefore be R. L. 120, and Flood level R. L. $117\frac{1}{2}$.

Water-spread and capacity.

6. The following is the water-spread and capacity at R. L. 116 and lower contours :—

R. L.	Water-spread in s. ft.	Capacity in m. c. ft.
116	38,475,000	
		3·17
115	24,975,000	
		7·87
110	14,175,000	
		2·17
100 (bed level).	765,000.	
	Total ...	15·21

Dam.

7. The Dam will be 1,343 ft. in length with a core-wall and front and rear slopes of earthwork. The core-wall will be 1½ ft. thick at top, increasing 6″ at every 5 ft. depth, by 3″ offsets on either side. The foundations will be carried down to rock, and in the centre portion, for 600 ft. in length, will consist of concrete to 2 feet below ground surface, when masonry will commence. The earthwork in front will start at Flood level with a 4 feet terrace, and have a slope of 3 to 1. Where the Dam crosses the nullah the front slope will be pitched. The earthwork in rear is 8 feet wide at top, and has a slope of 2 to 1.

Weir.

8. The Weir is of lime masonry 2 feet thick at top and 220 feet in length at the west end of the Dam, and at right angle to it across a gap in the ridge. With this length the maximum discharge of 1,427 c.ft. per second will be discharged with a 1½ ft. head.

Sluice.

9. A sluice is provided at chainage 500, with bed level R. L 108, which will give 11¼ m.c.ft. of water available for irrigation, sufficient for 113 acres.

A 6″ diameter sluice is sufficient to empty the tank in 3½ months, and to give a first watering of 6″ to the land commanded in 30 days, and this has been provided. The sluice consists of 2 masonry chambers, and is similar in design to that provided in the other Projects (see Plan No. 4).

Irrigation Channel.

10. The irrigation channel will have a bed width of 2 feet, depth of 1 ft. and side slopes 1 to 1. A channel of this section for ½ mile in length has been provided in the Estimate.

Materials.

11. All materials are available at site, except lime, which is obtained from Kachnaria, three miles away.

Abstract of Cost

12.

Dam	... Rs.	7,336
Weir	... „	662
Sluice	... „	1,569
Irrigation channel ...	... „	30
	„	9,597
Contingencies ...	... „	480
Total ...	„	10,077

13. The value of water stored is 1,509 c.ft. per rupee. Value of water stored.

14. If the 113 acres for which there is water are all irrigated at Rs. 5 per acre, a revenue of Rs. 565 should be realized each year giving a profit of 5½ per cent. on estimated cost. Revenue.

15. The surveys and plans were made by Sub-Overseer Wazirchand, under the directions and orders of the Superintending Engineer, Protective Irrigation Works. Preparation of Project.

SPECIFICATION.

16. All the demensions of the Dam are given in the Plan and Estimate, which are to be strictly adhered to. Dimensions.

17. The centre line and the slopes to be marked out with trenches one ft. broad and one ft. deep, showing permanently the inner and outer slopes, and the breadth of the top of the embankment. Marking out.

18. The embankment will be carried out in layers not exceeding 9″ in thickness, carefully consolidated. All the layers will be laid concave, that is lower in the centre. No clods of earth should on any account be allowed in the embankment. No earth to be excavated within 100 ft. of either toe of the slopes. Earthwork

19. The masonry of the core-wall, the outlet sluices, etc., to be of rubble stone set in lime mortar; only hard and durable stones to be used, and the masonry to be kept wet during construction. All the stones to be hammer-dressed, and to break joint in the same as well as in the successive courses. All stones are to be laid on their natural beds; where there is batter the beds of the stones are to be at right angles to the batter. Masonry.

Hollows between the larger stones to be filled in with smaller ones completely embedded in mortar. No empty hollow to be left, nor spaces filled wholly with mortar or rubbish where pieces of stone ought to have been inserted. The faces of the masonry in contact with the earth to be left quite rough, and those remaining exposed to be smooted and pointed with lime mortar.

20. The concrete to consist of 3 parts broken stone to 1 part lime mortar, well mixed together before putting in foundations, and to be laid in 6″ layers and well rammed. Concrete.

21. Mortar to consist of 1 part lime to 1½ surkhee; good stone lime burnt in kilns to be used. Lime mortar.

AJMER:

The 26th August 1904.

F. St.-G. MANNERS-SMITH,
SUPERINTENDING ENGINEER,
Protective Irrigation Works, Rajputana.

ABSTRACT.

Takro Project in Bundi State.

Quantity or No.	Item.	Rate.	Per.	Amount.	Total.
	DAM.	Rs. A.		Rs.	
18,373 c.ft.	Excavation (including rock cutting)	15—0	1,000 c.ft.	275	
8,036 „	Concrete	10—0	100 „	803	
25,756 „	Masonry	18—0	100 „	4,636	
293,421 „	Earthwork	5—0	1,000 „	1,467·	
5,174 „	Pitching	3—0	100 „	155	
	WEIR.				7,336
2,075 „	Excavation (including rock cutting)	15—0	1,000 „	31	
3,508 „	Masonry	18—0	100 „	631	
	SLUICE.				662
4,564 „	Excavation	15—0·	1,000 „	68	
2,604 „	Concrete	10—0	100 „	260	
4,404 „	Masonry	18—0	100 „	792	
203 „	Arch masonry	22—0	100 „	44	
250 s.ft.	Stone work	0—8	s.ft.	125	
1 No.	Sluice valve 6″ diameter ...	150—0	each.	150	
49 s.ft.	Iron Grating	1—0	s.ft.	49	
16 c.ft.	Woodwork	3—0	c.ft.	48	
130 r.ft.	Rod Iron for Ladders ...	0—4	r.ft.	33	
	IRRIGATION CHANNEL.				1,569
7,500 c.ft.	Excavation earthwork ...	5—0	1,000 c.ft.	30	30
	Total ...	...	...	...	9,597
	Contingencies, 5 per cent. ...	..	...	...	480

GRAND TOTAL ... Rs. 10,077